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LONDON CHAPTER
OAS

September 2004 04-5

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Raymond John of the **Oneida Nation on the Thames** has kindly agreed to come to the monthly meeting on Thursday October 14th/04 and do a presentation on ***Oneida Symbols and Wampum Belts***. Ray attended our talk by Dr. Tom Abler last March on ***Material Symbols of the League of the Iroquois*** and here is a chance to hear and see more about this fascinating topic. Unlike our traditional monthly talks this will be more of show and tell presentation with hopefully lots of interest and questions from the audience. So see you there in October!

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The meeting will be held at 8 pm at the London Museum of Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city.

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ANNUAL RATES

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THE HI-LO COMPONENT AT THE WELKE-TONKONOH SITE, AREA C

by Chris Ellis

The purpose of this paper is to describe in detail an early Hi-Lo lithic assemblage recovered from one locus of the Welke-Tonkonoh site in southwestern Ontario called Area C. Most reported Hi-Lo sites are multi-component and have much evidence of later site occupations which has made documenting whole tool kits and lithic source preferences very difficult. However, Area C has yielded one of the few known apparently single component Hi-Lo assemblages and although aspects of this assemblage have been briefly summarized elsewhere (Ellis 2004; Ellis and Deller 1982; Moulton 1990), it has never been fully analyzed or reported.

BACKGROUND

Hi-Lo is an early lithic industry which was first named and described by Fitting (1963a, 1963b) based on a surface collection from the Hi-Lo Gun Club property in southern Michigan. Fitting (1963a) regarded Hi-Lo as Late Paleoindian whereas other have seen it as Early Archaic (Wright 1995) and still other such as myself have, for reasons I will discuss below, split it into both Paleoindian and Early Archaic based on variation in its distinctive, if somewhat broadly defined, point style (Ellis 2004; Ellis and Deller 1990; Ellis et al. 1990). What I would define as Hi-Lo points have been lumped in with many other point styles in other categories such as Aqua-Plano (Quimby 1960), Unfluted-Fluted (Prufer and Baby 1963) or even more recently, Chesrow (Overstreet 1993). Aside from the fact Hi-Lo points as a type have been "loosely defined" (Mason 1981:114), part of the reason for these different characterizations is simply that the points themselves are very variable. Much of this variation, particularly in fore-section elements, is due to extensive resharpening and recycling. The resharpening often consists of reducing or modifying the side edges of the blade element usually by alternate left edge beveling such that they often end up with hexagonal to twisted cross-sections (see Ellis and Deller 1990: Figure 3.14). This form of resharpening strongly suggest they were used as more than just weapon tips as does the recasting of the fore-sections into other tool forms such as drills, end scrapers and gravers.

While such factors account for fore-section variability, they can not account for most for the basal variation one sees in these points. I have suggested elsewhere (Ellis 2004) that the basal variation can be used to recognize three varieties which probably represent a time series: 1) a lanceolate unstemmed form which seems to be transitional between Holcombe and other Hi-Lo forms and which have been called "Holcombe-like" (Ellis and Deller 1990: Figure 2d) or "Hi-Ho" (Deller and Ellis 2001; Timmermans 1999); 2) a "Classic" form which has a distinct, although not pronounced, stem or juncture of the wider fore-section and narrower basal area (at least prior to extensive resharpening); and 3), a shallowly but definitely side-notched variety which, using a totally arbitrary distinction between Paleoindian and Archaic as being the introduction of notched points, I tend to see as Early Archaic. The emphasis on edge-bevelling, the range in basal forms such that even side-notched examples occur, and several other characteristics have led to the suggestion that Hi-Lo is a Great Lakes analog of Dalton materials found in the southeastern to midwestern United States and

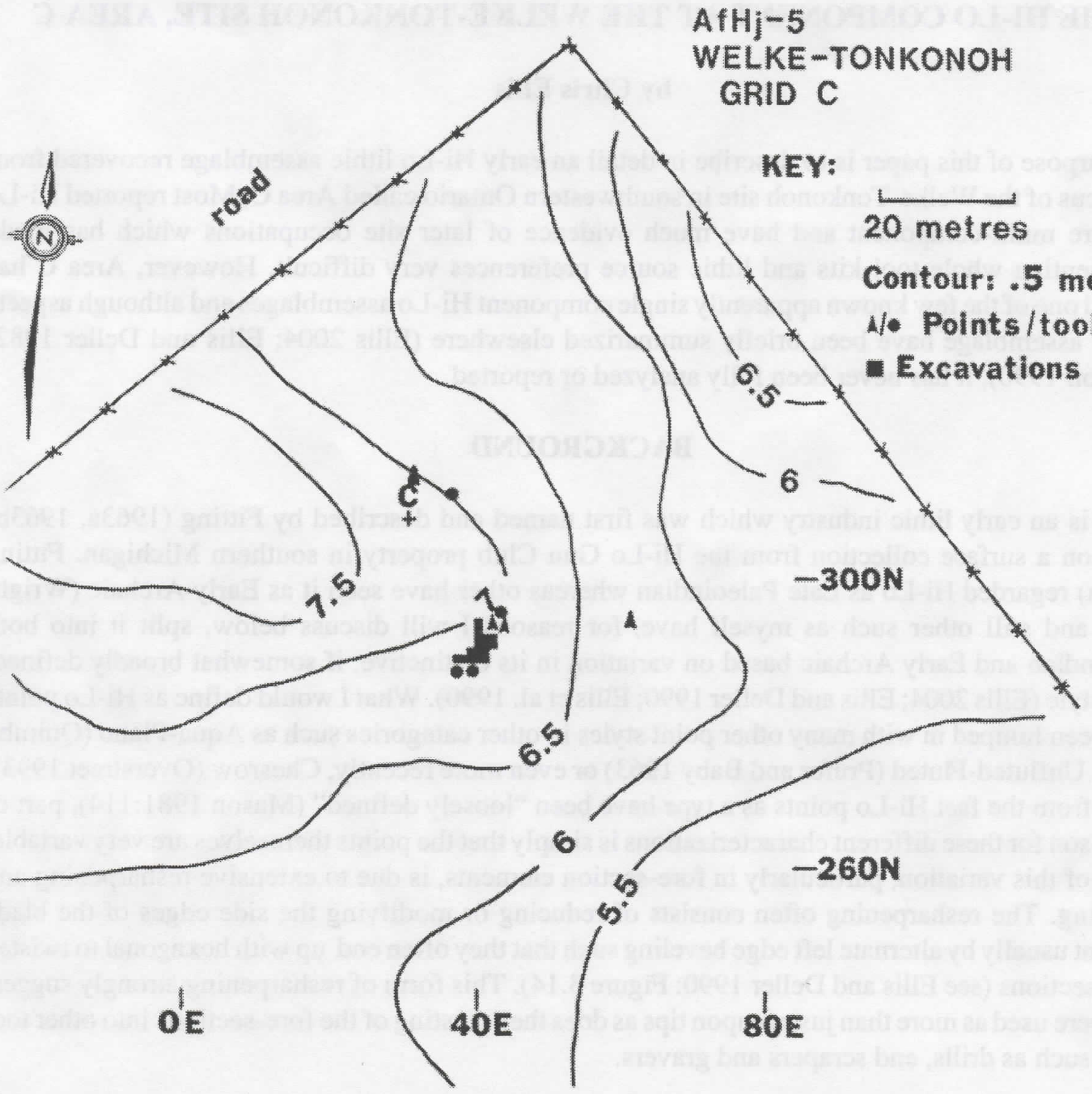

Figure 1: Map of Welke-Tonkonoh Area C. Datum heights are in relation to an arbitrary "0" elevation.

therefore dates around 10,000 B.P. (Ellis and Deller 1982).

WELKE-TONKONOH SITE

The Welke-Tonkonoh Site is located in cultivated fields just west of Mt. Brydges, Ontario and was discovered by Brian Deller and Reynold Welke in the 1960s. The site has proven to be one of the largest and most productive Hi-Lo sites ever found. It includes at least five discrete concentrations of material distributed overall across about 20 ha and there are several nearby locations on adjacent farms given different site names that could also be considered part of the same site. Most of the Hi-Lo site areas are quite small spatially being under 200-300 m^2 but an exception is Area A which lines an elevated area crossing the site centre and which overlooks on its south margin a lower area of marshy ground surrounding a small tributary stream. Area A covers at least 1500 m^2 and based on Hi-Lo point form variability, I would suggest it was used on and off for a long period of time. Unfortunately, much of Area A, as well as most other site areas, are markedly multi-component, so sorting out artifacts other than points becomes somewhat difficult in those areas. However, Area C seems to be an exception.

Area C is a previously unknown Hi-Lo concentration located near the northern site margin some 200 meters due north of Area A. It was discovered accidentally in 1980 during a 12 week project I directed which investigated the site through surface collection and excavation (Ellis 1981). It happened to be located between the road where we parked our van and Area A where we were excavating at the time. In traversing the area a Hi-Lo point fore-section was found. Subsequent examination recovered several other tools and we learned of another Hi-Lo point in a local collection which came from the area and which I was able to examine and photograph. As tends to be the case, important discoveries always occur near the end of a project and the discovery of Area C was no exception so only limited excavations were carried out and the combined surface and excavated material included about 20 tools or fragments at that time which have been summarized elsewhere (Ellis and Deller 1982; Ellis 2004). Subsequent, surface collections by me in 1981 yielded a few other tools which were piece plotted, and in the mid-1980s a local resident surface collected several more items which lack exact piece-plots but were given to me and form part of the analyzed collection which now totals 32 tools. Land alterations by the site owner in the late 1980s resulted in Area C being buried such that it is no longer accessible to surface collection.

Area C is located on the south end of a small knoll which extends to a fence-line to the north, beyond which there is a ditch lining a concession road (Figure 1). Traces of Glen Meyer use of the more northern part of the knoll had been noted earlier by Brian Deller (personal communication) and we noticed some small sherds and bone fragments on the surface in that area but none of the surface material was closer than ten metres to the areas where the apparent Hi-Lo material occurred. In fact, and aside from some metal and glass pieces from historic period use, the only direct evidence we encountered of later use of the Hi-Lo area was a small, less than 20 by 20 mm, body sherd probably from an Early Ontario Iroquoian vessel, found during our excavations on the south edge of the knoll and which I assume was dragged there by site ploughing. Moreover, the bulk of the stone artifacts recovered are of distinctive forms which are clearly not Glen Meyer and with few exceptions, all those stone tools are on a distinctive material, Haldimand chert (see Parker 1986a, 1986b), which was little used in the site vicinity by groups other than Hi-Lo. Haldimand is found commonly among only the Hi-Lo points at Welke-Tonkonoh but except for one bifurcate based point (Ellis et al. 1990: Figure 4.9b) does not occur among the 135+ other points I have examined representing all other time periods. In short, virtually everything recovered from Area C can be confidently assigned to Hi-Lo use of the area.

As noted above, we were only able to excavate a small area in the time available in 1980 which consisted of 16 m^2. These excavation were placed in the centre of the south edge of the knoll on a location which encompassed an area where a Hi-Lo point and two small morphologically identical

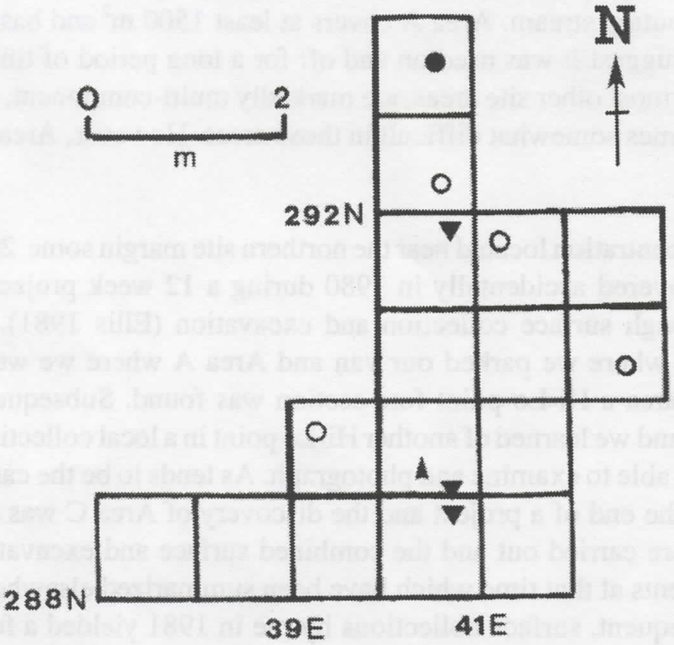

Figure 2: Map of Excavated Units Showing Artifact Locations, Area C. Triangle: Hi-Lo Point; Inverted Triangles: End Scrapers; Solid Circle: Side Scraper; Open Circles: Retouched Flakes.

oval end scrapers (one on Haldimand, the other on Onondaga) had been found on the surface (see Figure 1). Excavations at the site as a whole were carried out in relation to a main grid of two metre units oriented such that magnetic north parallelled the north-south grid lines at the time of the excavations. The four one metre sub-units within the main square system were removed separately and one metre unit of the four, selected at random, was passed through 1/8" mesh and the rest through 1/4" mesh. However, since our time was limited, and we did not excavate all the one metre subunits in each major two metre unit, only two of the sixteen one metre units ended up being excavated employing 1/8" mesh. The 9-15 cm thick ploughzone was removed one shovel load at a time and artifacts except simple flaking debris recovered from a shovel load were piece-plotted by cross-tape triangulation. We took each square down at least 10 cm into the subsoil to be sure to recover items which had moved down due to natural processes such as root intrusion. Aside from the point and end scrapers noted above, the excavated area yielded another end scraper, an alternately retouched side scraper, a side scraper fragment and three retouched/used flakes (total =9 items) as well as the small sherd noted above and some flaking debris to be described below (Figure 2). Additionally, two points, two retouched flakes and a scraper fragment were found on the surface within two metres of the excavated area. In the excavated area no cultural features were encountered and all the recovered material was from the ploughzone. Unless otherwise noted in the following the described items are on Haldimand chert.

ARTIFACTS

Hi-Lo Points

In all five Hi-Lo points were recovered from Area C including three relatively complete items and two fore-section segments (Figures 3 & 4; Table 1). One of the fore-sections is on Kettle Point chert. All the points are typical of the type in that they have heavily ground lateral basal edges and concavities, short basal thinning (<21 mm) on one or both faces, shallowly concave (<2.8 mm) bases with more rounded "knobby" ears, thick cross-sections (5.2-9.3 mm) and so on. Two of the complete points are clearly side-notched. The third (Figure 3a) appears more stemmed but careful examination of its base shows both corners are damaged such that any expansion below the notch has been broken off. In sum, all three points were apparently side-notched as is another point which has been recycled into a drill (see below) so Area C might be regarded as an Early Archaic Hi-Lo component.

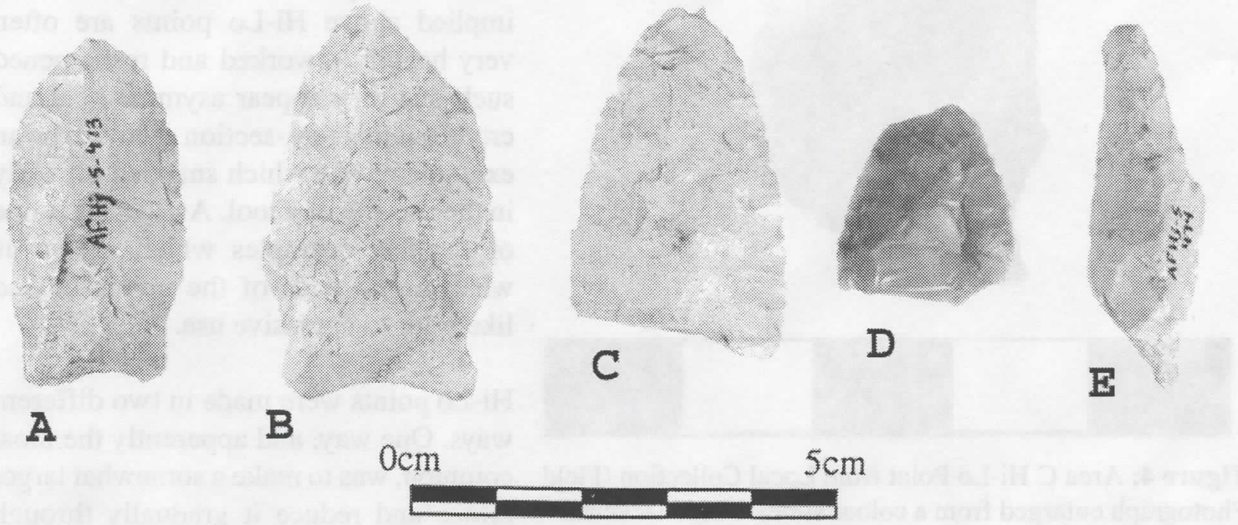

Figure 3: Hi-Lo Points (A-D) and Bulbous Rod-Like Biface (E), Area C.

Table 1: Data on Hi-Lo Points, Area C.*

FC #	Condition	Length	Width	Thick	Basal Width	Concavity Depth	Stem Length	Basal Thinning Length
5	fore-section	-	25.5	9.3	-	-	-	-
82	fore-section	-	21.3	5.2	-	-	-	-
414	complete	38.0	21.5	6.5	-	2.8	10.0	-
473	complete	41.4	21.9	6.8	21.9	1.3	11.9	21.0, 12.2
483	complete	46.6	27.6	7.6	22.8	1.6	13.0	-

*all measurements in mm. FC#: Field Catalogue Number.

Two of the points and the one fore-section on Kettle Point have a slight alternate left bevel as is characteristic of these points and suggests use of those edges as tools such as knives. Nonetheless, the fore-sections and one of the complete points which is also bevelled, have tip impacts indicating they were probably also used as projectile tips as well and that these different uses were interspersed in time; that is, they were not first used as points and then as knives in any consistent manner and this evidence is consistent with the much larger assemblage of Hi-Lo points from other site areas. The other fore-section (Figure 3c) is long with a symmetrical biconvex cross-section and is certainly very well made and comparable in workmanship to earlier fluted points. As implied above Hi-Lo points are often very heavily reworked and resharpened such that they appear asymmetrical and crude but this fore-section seems to be an example of one which snapped off early in the use-life of a tool. As such, it is one of the few examples which shows us what the tip ends of the points looked like prior to extensive use.

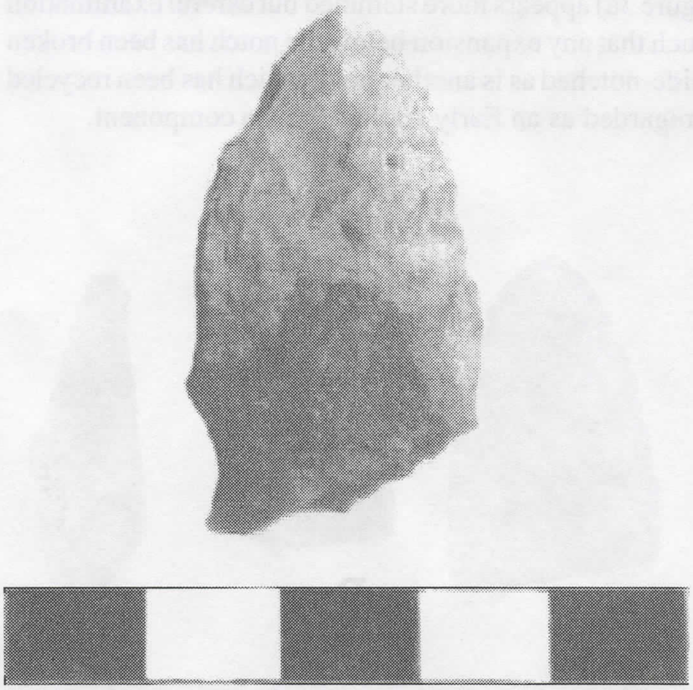

Figure 4: Area C Hi-Lo Point from Local Collection (Field Photograph enlarged from a colour slide). Note blackened original blank surface on lower central area.

Hi-Lo points were made in two different ways. One way, and apparently the most common, was to make a somewhat larger biface and reduce it gradually through intermediate stages to the much relatively smaller finished point, a technique called serial biface reduction (Knudson 1973). Another way was to use a flake blank not much larger than the finished point and with little reduction produce the finished product: direct thin flake manufacture (Knudson 1973:38). Examples of the latter technique tend to retain attributes on the finished product of the original flake blank as they have not been highly reduced to obliterate those characteristics and to remove them completely would produce too small a point. One characteristic is a plano-convex cross-section as seen on the original flake and two of the Area C examples, both the complete side-notched points, have such a characteristic. Another characteristic often produced in this manufacturing procedure is a flat surface on the plano face which is a segment of the original, flat, interior surface of the flake and one of these points also exhibits such a feature. What is interesting about the original retained flake surface is that it is darkened or "blackened," one presumes from heat exposure. This darkening formed only a rind such that it was clearly removed in the areas which were subsequently flaked (Figure 4). This same feature was noted many years ago on a Haldimand chert Hi-Lo point found in the Pickering airport surveys by Dana Poulton (personal communication, 1983) and I have seen at least one other in a local collection. Since the darkening occurred before the flaking and when the piece was in a flake blank form, I can think of no way such heating could have occurred unless it was purposeful thermal treatment to improve the flaking qualities of the chert (e.g. Crabtree and Butler 1964), a technique documented in several stone tool industries including fluted point ones. However, experiments are clearly needed to show such blackening is a result of heat exposure and that it can be produced in the manner best suited to the purposeful heat treatment of cherts: baking in sand and not direct exposure to the heat source or simple burning.

Rod-Like Bifaces/Drills

Two items in the collections have rod-like or drill-like working ends. One item was clearly made by recycling a side-notched Hi-Lo point. Unfortunately, this item disappeared from the collections at the University of Waterloo in the late 1980s but the item was illustrated in Ellis and Deller (1982: Figure 3a). It measured 19.8 mm across the base and 20.1 mm in overall width, had a 2.9 mm deep basal concavity and was 6.2 mm thick. The tip of the "drill" had been broken off, presumably in use, so its bit form is unknown. One side edge at the top of the haft element or notched stem had an almost burin-like spall scar which originated in the tip vicinity and had removed a segment down the tool edge towards the base. The top of this scar had been removed by the subsequent recycling into the rod-like fore-section. This kind of lateral edge burin-like spall removal has been observed on other Hi-Lo points and it usually occurs in conjunction with a heavy tip impact (e.g. Ellis and Deller 1982: Figure 2i). In sum, the force of the point striking an object leads to the tip being smashed or crushed and at the same time a spall is driven right down the side edge creating the kind of scar seen here. This breakage is strongly suggestive of use of this item as a projectile tip before it was reworked into a drill.

The second drill-like item (Figure 3e) measures 43.6 by 14.9 by 12.1 mm and has a thick bulbous centre and rod-like projections at both ends. It may also be recycled from some other biface such as a point but there is no clear evidence to support such an interpretation. At one end there is a 21.0 mm long projection which is somewhat diamond shaped in cross-section and has a blunt, relatively wide (4.9 mm) tip in plan. Under the microscope the apex of the tip and the adjacent ridges on the faces appear highly polished from use. The opposite end has a similar but shorter (10.0 mm) and narrower (3.5 mm at the blunt tip) working edge which, like the first has smoothed and polished edges and ridges at the tip. One presumes the tool was hand held because of these two opposite working edges.

Table 2: End Scrapers, Area C.

FC#	Form	Length	Width	Thickness	Bit Width	Bit Depth	Bit Thickness	Bit Angle
153	triangular	28.1	28.4	7.9	28.4	8.9	7.3	50-65°
481	triangular	28.8	21.5	6.7	21.5	6.8	5.2	50-70°
482	triangular	34.8	23.6	7.8	23.3	8.5	7.6	65-75°
52	oval	-	20.9	5.0	25.3	13.2	4.3	50-70°
53	oval	24.0	26	6.1	25.1	10.4	4.9	55-60°
480	oval	-	-	-	25.9	13.5	2.9	50-60°

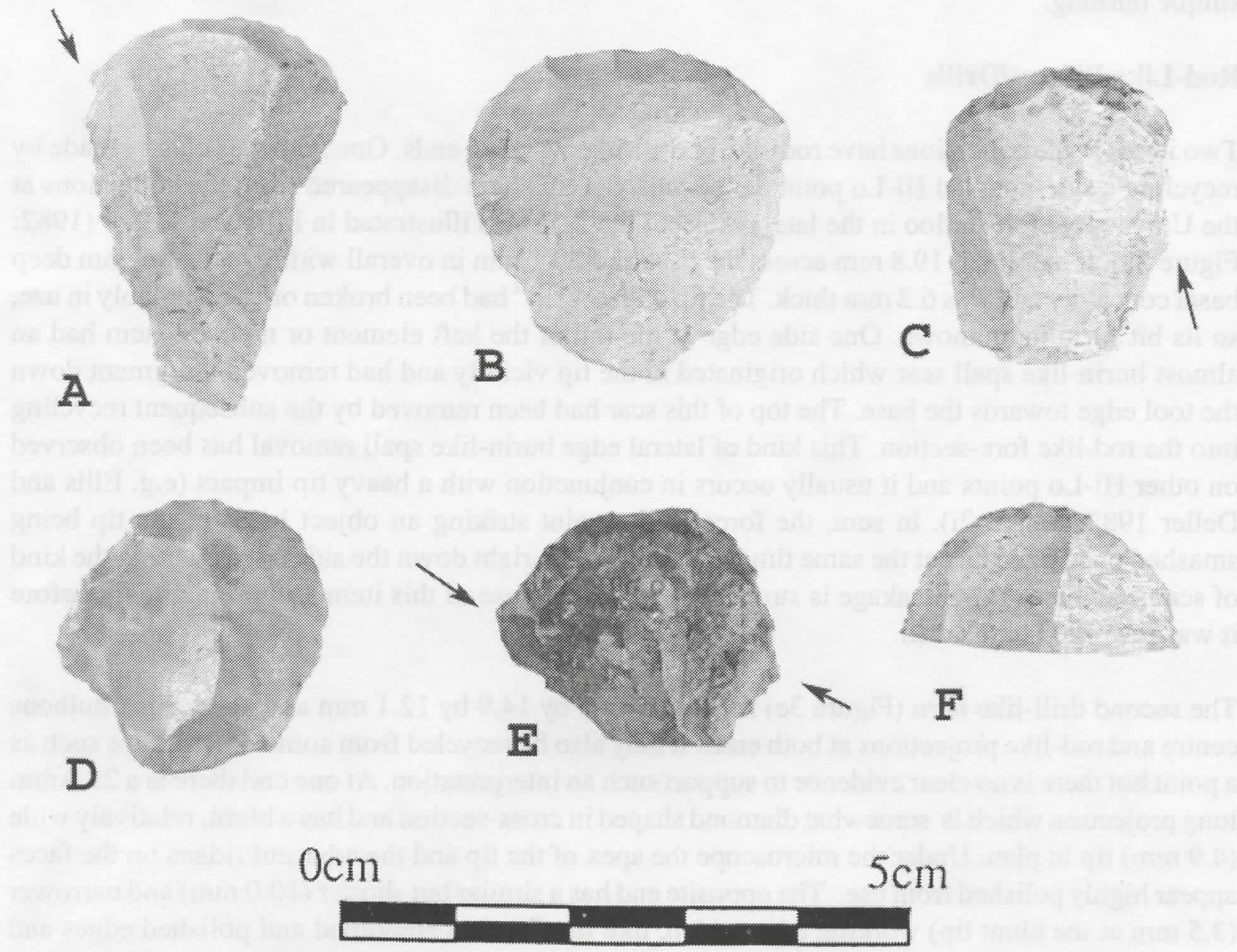

Figure 5: End Scrapers, Area C. Arrows show spur locations.

End Scrapers

Six end scrapers are in the collections and these seem to represent two somewhat distinct forms. One form, represented by three examples (Figures 5a-c; Table 2), has a trianguloid outline with gradual tapering side edges, emphasized in two cases by extensive continuous retouch along one of those edges. The tapering edges and, in one case, the removal of the platform, suggest the tools were hafted in a socketed or slotted handle. In longitudinal section the tools are slightly curved towards the bit end. Although they are somewhat small, these items closely resemble morphologically the most common end scraper form seen on earlier Paleoindian sites. The bits are relatively flat in plan with bit width to depth ratios between 2.7 and 3.5. One item (Figure 5b) is made on a large flake from a biface core and the use of such blanks is common on fluted point sites (e.g. Deller and Ellis 1992:20-22; Wright and Roosa 1966) while the other two are on flakes from more blocky to squarish cores. In fact, these latter two items have along one edge, a flat, unaltered surface of the original raw material block on which they were made. Those surfaces are at right-angles to the transverse axis of the tools. These surfaces are unbattered as is characteristic of bedrock deposits and their orientation indicates both tools were made on flake blanks struck off a relatively right angled corner of a blocky core. Use of such corner-struck flakes for more trianguloid forms is seen on other finds from Welke-Tonkonoh (e.g. Ellis and Deller 1982:Figure 4m) and also occurs on earlier fluted point sites.

Two of the items have lateral spurs which is also often seen as a Paleoindian trait although the spur placement, and perhaps function, varies between these two items. In one case (Figure 5a), the spur is right behind the bit at the left edge-distal end margin as is typical of Paleoindian tools. This spur has been made by placing a notch behind the bit which isolates the point at the corner. It is unclear whether this is a hafting notch which was encroached upon by extensive bit resharpening or whether it is a purposefully created working corner. In the other case (Figure 5c), the spur is on the right edge and is much back (12 mm) from the bit corner. The spur seems to have been purposefully formed by the application of a fine dorsal retouch all along the edge and it may be a product of recycling which occurs on these tools. Trianguloid end scrapers recycled into gravers or piercers clearly occur on earlier fluted point sites with the spurs even being flaked into the formerly hafted proximal ends (e.g. Ellis and Deller 2000: Figure 6.10a-c; Gramly 1982: Plate 23d). Items comparable to these triangular forms were reported from the Stelco I Hi-Lo site near the mouth of the Grand River (Timmins 1995).

The three remaining end scrapers include two complete items and one snapped bit end (Figure 5d-f). One of the complete items is on Onondaga chert while the other is on a blackened and presumably burned Haldimand. These end scrapers are even smaller than the triangular forms and they also differ from the previous items in that the lateral edges markedly expand from the proximal end. In addition, the bit ends are not only relatively thin (see Table 2) and flat in longitudinal section but are also, even in a heavily resharpened state, still quite convex in outline with bit width to depth ratios of 1.1 to 2.4. Therefore, they are much more oval than triangular in overall outline. The blackened Haldimand item has minor damage/snap at the proximal end and two projections or spurs occur at the bit corners (Figure 5e) but these do not seem to be purposeful working edges. As the bit is resharpened and gets shorter and closer to the handle, if one wants to maintain a convex working edge the bit area resharpened would get narrowed as well but could not be narrowed at a point beyond the enclosing haft. Therefore, the spurs simply reflect the juncture of the enclosed haft with the narrower resharpened bit area. The small snapped bit and the one more complete item on Onondaga, both have a single centered dorsal ridge such that their cross-sections are triangular. It is possible these two items were actually made on small "blades" which will be discussed more below. Items comparable to these scrapers come from other sites with Hi-Lo components (e.g. Ellis and Deller 1982: Figure 4h).

Other Scrapers

There are three other scrapers at Area C; that is tools with extensive (e.g. longer than 2.5 mm in from an edge and >10 mm along an edge) retouch on one or more margins. One is simply a short snapped distal end of a tool which had dorsal scraper retouch along the left margin and inverse retouch on the right margin; in other words it seem to be the end of a double alternate side scraper, a rare but

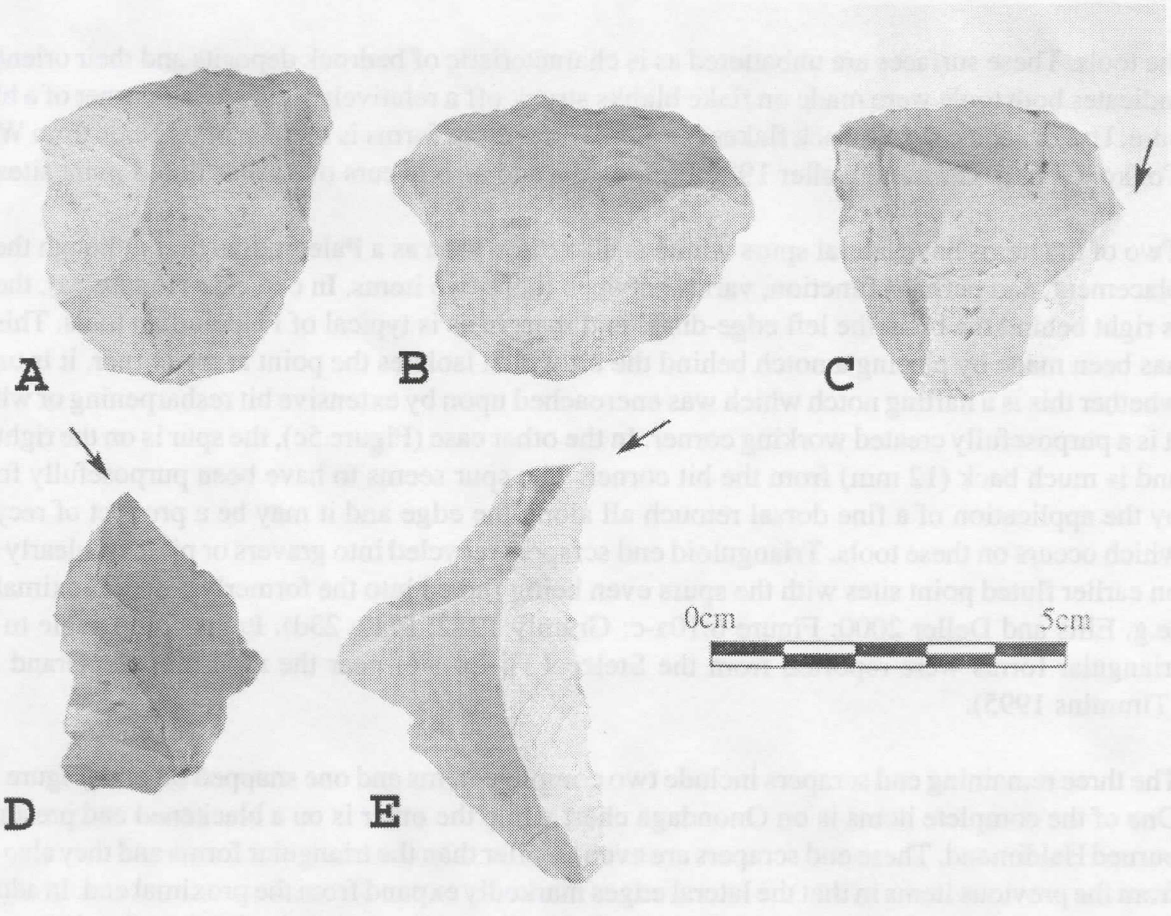

Figure 6: Unifacial Tools, Area C. A: Scraper with retouch at distal left end; B: Transverse scraper; C: Combination scraper/beak (arrow shows beak location); D-E: Borers or massive spurs. E also has denticulated right and distal margins.

nonetheless consistently present form on earlier fluted point sites (e.g. Deller and Ellis 1992:68).

The other two tools are complete and both have the scraping edges at the distal end opposite the flake platform but are not easily classified as end scrapers. In one case (Figure 6a), the item is on a relatively triangular flake (45.5 by 38.9 by 9.1 mm) from a blocky core and the steeply retouched (70-80º), 23.3 mm long scraping edge is restricted to the distal left end with no retouch on the right distal end. This tool also has fine (e.g., <2.5 mm long) continuous retouch along the right side margin and intermittent retouch on the left edge. The other item (Figure 6b) was made on a flake which was apparently quite curved and very broad (39.6 by 49.4 by 9.3 mm). The underside at the distal end has had several large thinning flakes removed which I believe was done to remove the marked distal curvature of the original flake blank. Subsequently, a continuously and steeply (70-80º) scraping edge was flaked all across the distal end and around the right distal corner continuing onto the lateral edge. The edge retouch has produced a distal margin which is somewhat irregular, almost denticulated, in plan. Tools such as this which have distal retouch but are wider than their length are reported, albeit rarely, from Paleoindian sites (e.g. Ellis and Deller 2000: Figure 6.20j) where they are often called by the Old World designation: transverse scrapers (cf. Bordes 1961:28).

Pointed Tools

There are six tools in the assemblage which have pointed working edges or projections of various forms (Table 3). Two of the tools have massive spurs or borers (5-7 mm long; 2.3-2.8 mm thick) flaked into a corner at the distal right distal end by steep (70-90º) distal retouch. One, on an Onondaga chert flake removed form a blocky core (Figure 6d), has solely the borer and no other modifications. The other (Figure 6e), which is on a large flake from a biface core, has secondary modifications on other margins. Along both lateral edges it has a fine, discontinuous, bifacial retouch which forms a denticulated margin with a 25-50º edge angle. An apparent notch near the distal end on the left margin seems to be a recent plough scar as unlike all the other working edges, it is unweathered. The distal end has a more continuous, yet still fine and denticulated 40-45º working edge. Tools like this, which incorporate massive borers with denticulated and other forms of working edge, are again common on earlier sites (Deller and Ellis 1992:68).

Table 3: Pointed Tools.

FC#	Type	Figure	Material	Length	Width	Thickness
420	Borer	6d	Onondaga	39.8	29.5	7.0
478	Borer	6e	Haldimand	53.2	44.3	8.1
159	Piercer/Graver	7a	Haldimand	24.5	32.3	6.2
476	Piercer/Graver	7b	Haldimand	24.2	29.5	5.3
484	Piercer/Graver	7c	Haldimand	36.4	34.2	9.8
422	Beak/Side Scraper	6c	Haldimand	38.5	41.6	11.3

Three other tools are gravers with fine retouch. One (Figure 7a) is on a biface thinning flake which are commonly used on Paleoindian sites for such tools. At the left distal corner there is a finely flaked spur which has one margin formed by a small snap and the other by dorsal or normal retouch. I have called these spurs formed in this manner "one edge normal-unifacial" elsewhere (Deller and Ellis 1992:70-71) to reflect the fact one margin is produced by the steep snap rather than retouch. This tool also has a steep short retouch extending away from the spur across the distal end and the right corner has an extremely fine (0.8 mm long) and well executed retouch which forms a wide (8.1 mm) projection with a squarish outline. A second tool (Figure 7b), possibly also on a biface thinning flake, has a single spur with very fine retouch on both its margins (<0.5 mm long) which may have been produced by use of a small natural projection rather than being a product of manufacture as a spur. It is also quite polished when examined microscopically. A third item (Figure 7c), on a slightly large flake from a more blocky core to judge by its right-angled platform, has two closely spaced (5.2 mm) and very fine spurs at its distal corner. One spur, right at the corner, is partially broken and has an alternate retouch suggesting it may have been used in a rotary manner. The other, just along the corner on the distal margin, was formed by bilateral retouch. These spur forms and their spacing, are very reminiscent of "compass gravers" as defined by Tomenchuk and Storck (1997) from fluted

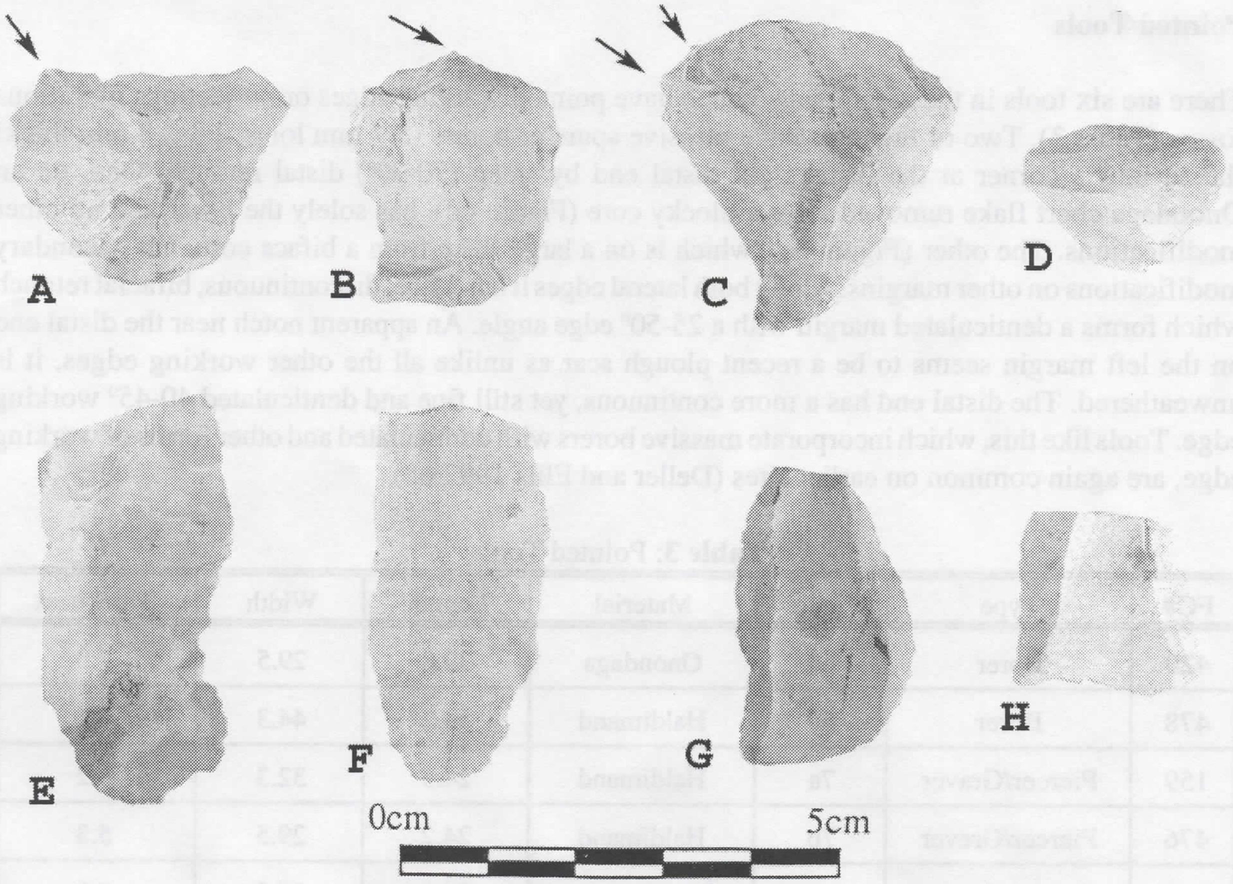

Figure 7: A-C: Piercers or Gravers (arrows show spur locations); D: Retouched biface thinning flake with continuous distal retouch ("raclette"?). E-H: Retouched "blades".

point sites. They argued these were used in the same manner as using a compass to draw a circle: the one graver with an alternate retouch was a pilot spur which was rotated in a guide hole, while the other was used to inscribe/engrave a circular design or even cut a circular hole in bone, equidisant from the guide hole. In addition to the spurs, this item exhibits a fine, discontinuous bifacial retouch across the distal margin.

The final tool (Figure 6c) is made on a blocky flake, the whole interior if which is a flat, untumbled surface of the original piece of Haldimand chert and indicates a primary bedrock source. Flakes removed from flat surfaces tend to have cross-sections which are the reverse of most flakes: the dorsal is the flat surface and planar rather than more convex and the ventral tends to be more convex and less flat. Moreover, it is difficult to remove flakes from flat surfaces and they often hinge-out or terminate abruptly. Both characteristics are seen on this tool's blank. The retouch has been applied to the ventral face which is the reverse of that normally seen and the sole reason seems to be this blank morphology. The dorsal surface is flat so it is hard to drive retouch flakes off it as they tend to hinge out. Hence, the retouch is more easily applied to the more convex underside and it is not surprising that when these kinds of flake blanks are used they often have ventral rather than dorsal retouch (see, for example, Ellis and Deller 2000:123). Regardless, a long 60-70° scraper retouch has been applied along both lateral edges. On the right edge this retouch extends around the distal corner onto the snapped end/hinge termination. While the left edge could be considered simply a convex side scraper, the right edge differs in that there is a broad (11 mm), projecting (4 mm) beak just back from the corner. Hence, this tool also could be considered a beak or beaked scraper, yet another common tool form on Paleoindian sites (see Storck 1979).

Other Tools

Excluding two steeply retouched, probably side scraper, fragments, all other items from Area C are simpler, more expedient unifaces. Two tools have a fine continuous, well-executed retouch and might be considered raclettes. One, recovered in the excavated area, is on a biface thinning flake and has distal retouch forming a slightly convex working end such that it might also be considered an end scraper (Figure 7d). It measures 17.3 by 24.4 by 4.2 mm. The other, also from the excavated area, is the distal end of a flake which has the retouch along one left margin. This item is on a brown granular material which we cannot identify although we have seen the odd Hi-Lo point on the same material including one from Area A at Welke-Tonkonoh (e.g. Ellis and Deller 1982: Figure 2p).

The remaining tools, which have a fine, more or less discontinous, retouch on one or more margins, are referred to here as simply retouched flakes. Characteristics of each tool are listed on Table 4 and only some general comments about blank selection will be offered here. One item is made on a relatively large and triangular shaped flake from reduction of a blocky core form and has somewhat naturally irregular edges while another, which is broken at the proximal end, may be on a biface thinning flake. The remaining four items (Figure 7d-g) are relatively small, exhibit straight profiles with little longitudinal curvature except at the distal end where the flake plunged through the bottom of the core, and include two relatively complete tools as well as one proximal end and one distal. One of the complete items and the proximal end are on Onondaga. They are of interest because they are all were apparently made on flakes which meet, or probably would have prior to breakage, the minimal definition of a blade (e.g. Bordes 1961) as a flake more than twice as long as they are wide. However, they also exhibit other characteristics of more refined definitions of blades (e.g. Bordes and Crabtree 1969), notably that they are relatively parallel-sided and they exhibit flake scars on the dorsal surfaces, as well as the ridges between flake scars, which parallel the longitudinal flake axis and indicate the removal of previous elongated flakes of the same nature from the core. As noted previously, two of the small oval end scrapers may be made on similar flakes of a specialized form. Two of the retouched blades have a single-well-centered ridge (Figure 7e-f) and this results in a triangular transverse section whereas the other two were placed so as to encompass the complete scar of a previous blade (Figure 7g-h) and hence, have two parallel ridges and trapezoidal transverse sections. In the case of the two items with triangular sections, one of which is on Onondaga and one of which is on Haldimand, one of the dorsal facets is a flake scar but the other is an original surface of the raw material. These original surfaces indicate the blank were really in the reduction of the core and also indicate the use of a secondary chert deposit in the case of the Onondaga source and a primary one in the case of the Haldimand source.

Although these items are morphologically small blades, this does not mean that they are technologically such; that is, we do not know if they were removed from cores specially designed and shaped to yield multiple blades. Demonstration of a blade technology is difficult in the absence of large samples and/or actual core nuclei. At the very least, even if they are not blades in a technological sense, there is a suggestion such elongated flakes were deliberately selected or produced and used whenever possible in Hi-Lo. They seem relatively common in reported assemblages and are found at other areas at Welke-Tonkonoh as well as other sites (Ellis 2004; Timmermans 1998). Moreover, identical small blades are also reported from earlier Holcombe sites and in fact, these blanks can be made into similar tools such as concave side scrapers (compare Fitting et al. [1966: Figure 9e-i] with Ellis and Deller [1982: Figure 4l]) and this suggests some continuity between the two beyond that seen in point forms alone. Ellis and Deller (1982:17) also noted that small "blades" were consistently reported from Dalton (e.g. Goodyear 1974:56-58; Sherwood et al. 2004:544-545) and related industries farther south although unlike Hi-Lo, some sites have actually yielded small blade cores (e.g. Daniel and Wiesenbaker 1987: Figure 31). This similarity also suggests another possible tie between the Hi-Lo and those southeastern developments.

Table 4: Retouched Flakes.*

FC#	Blank Form	Length	Width	Thick-ness	Retouch Location	Retouch Type*
119	block core flake	42.1	39.5	13.2	right lateral	normal, discontinuous
486	unknown	-	23.5	5.8	both laterals	Left: inverse, discontinuous Right: normal, continuous
6	"blade"	-	19.8	4.2	right lateral	inverse, continuous
156	"blade"	43.2	20.4	4.1	both laterals	Both: normal, discontinuous
477	"blade"	-	22.6	4.9	right lateral	bifacial, discontinuous
485	"blade"	46.3	22.9	6.1	both laterals	Left: bifacial, discontinuous Right: normal, continuous

*normal retouch: unifacial and on dorsal surface; inverse retouch: unifacial and on ventral surface.

Flaking Debris

As noted above, the only lithic debris recovered from the area was from the excavated units. Excluding a single popout flake on Halidmand chert produced by heat exposure rather than flaking, and even though 16 units were excavated, only 17 pieces of lithic debris were recovered and some units yielded absolutely no debris. This low yield may seem especially surprising given that no less than nine tools or fragments came from that same area such that the debris to tool ratio is only 1.8 to 1.

The debris is on the same materials represented among the tools; namely, Haldimand (N=7; 41.2%), Onondaga (N=6, 35.3%) and Kettle Point (N=4; 23.5%). These proportions are quite different though than their representation among the tools (81.3%; 12.5% and 3.1% respectively) with the main difference being Haldimand is less common and the other two material are more common. The debris as a whole is also generally small, averaging 0.57 gm. There are no pieces weighing more than 3.25 gms and actually only two pieces weight more than 0.68 gram each. The two larger pieces are both on Kettle Point. They include a relatively large (3.25 gm) core reduction flake retaining a partially cortical surface which indicates the original piece was a small tumbled pebble, and another large core reduction flake (2.79 gm) which at the platform end has considerable battering on both the dorsal and ventral surfaces suggesting it was battered subsequent to detachment perhaps as a bipolar piece. In any case, the four Kettle Point flakes average 1.63 gm while the Haldimand average only 0.21 gm apiece and the Onondaga only 0.29 gm.

The Haldimand items include three flakes from the finishing stages of biface manufacture or resharpening, a single uniface retouch flake, and three small flake fragments. In sum, all the definitive flaking debris on that material is from simply resharpening or tool refinishing and combined with its small size indicates no core reduction was carried out on the site. The Onondaga debris includes a small piece of shatter (0.62 gm) which one might normally associate with core reduction but if it was extensive their should be more such debris and the remaining items include only four small flake fragments and a biface thinning flake which must be from tool finishing or resharpening. It is plausible therefore, that the single piece of shatter may actually represent a fragment of a unifacial tool even though no evidence of retouch or use is present. Only the minimal reduction of Kettle Point, perhaps a single pebble, indicates anything other than tool resharpening. That material could even be associated with the same occupation as the single sherd recovered but at best, if Hi-Lo associated, suggest the expedient use of a piece(s) of till chert and such expedient use of those cherts has been documented at other early sites (e.g. Ellis and Deller 2000:183-184).

To continue, the emphasis on tool finishing or resharpening is one reason for the very low frequency of debris. The main materials used seem to have been brought to the site as finished tools ready for use or as late stage preforms. There is little or no core reduction which produces abundant debris. The same strategy is seen on earlier Paleoindian sites where the exotic materials brought in evince no extensive evidence of core reduction. If one is going to carry certain materials long distance, as is seen on earlier Paleoindian sites and in the extensive use of Haldimand at Area C, the transport of finished or almost finished tools reduces the amount of material which need be transported and trimmed off as waste – it produces a much more portable tool kit (Deller and Ellis 1992:87-88). A second reason for the very low amount of debris relates to the kinds of tools found at Area C. Most are simple unifaces. Any flakes derived in retouching or making those tools are going to be so small as to be not recoverable in 1/4" mesh used in most squares and in fact, the size of the retouch flake scars on unifaces in the assemblage indicates most resharpening flakes would be so small as to even pass through 1/8" mesh. At Area C, and as is clearly the case at earlier Paleoindian sites where uniface tools dominate, the result is a paucity of recovered flaking debris and a very low debris to tool ratio (see Deller and Ellis 1992:88; Ellis and Deller 2000:224; Muller 1999).

SUMMARY AND CONCLUSIONS

Area C at Welke-Tonkonoh seems to be a pure or almost pure Hi-Lo component as indicated by the consistency in tool forms and raw material source usage and as such is very significant in terms of understanding lithic procurement and transport strategies and in documenting the nature of the tool kits associated with Hi-Lo points. As should be clear based on the foregoing, even though the points recovered are of the side-notched variant and therefore, could be arbitrarily seen as Early Archaic rather than Late Paleoindian, the assemblage is very similar morphologically and technologically to earlier assemblages, particularly those associated with fluted points. The raw materials used and specifically the focus on Haldimand chert, suggests a settlement range in a direct line of 175 km or more and these distances are comparable to those seen on earlier assemblages. Moreover, like the earlier assemblages, the exotic raw material used is one not widely used by later groups who exploited the same areas and there is a focus on bedrock sources of chert rather than a secondary deposits except as a minor supplement. It is not at all clear why Haldimand was used, and especially in contrast to Onondaga which outcrops in the same area as Haldimand, is of higher quality for knapping and of course, was the major material used throughout all of precontact southwestern Ontario. The same preference for Haldimand has been demonstrated in the Haldimand source area. At the Stelco I site, a side-notched Hi-Lo component near the mouth of the Grand River, Timmins (1995) found that all the items were made on Haldimand from 21 km away whereas Onondaga chert, which outcrops as close as only 13 km away in the same direction from the site, was almost totally ignored. I argued some years ago (Ellis 1989) that factors such as simple availability, flaking quality of materials or lack of knowledge of sources are not the primary reason for selective raw material choice among these early groups and see it difficult to interpret these Hi-Lo data in any other way. Social and ideological reasons are, I believe, much more important in raw material selection among these early groups.

As discussed, the waste flake assemblage from Area C also suggests Hi-Lo used similar strategies to transport chert to locations of tool use such as only transporting highly reduced forms like preforms or flake blanks away from quarries. The results are that there is little debris at sites, and especially at sites dominated by unifaces, and the debris aseemblage consists of largely very small, final stage, finishing or resharpening flakes. The Area C assemblage also documents the continued use of standardized core reduction, such as the use of large biface cores as seen on earlier fluted point sites, and perhaps the use of small blade cores although much more research is needed to evaluate the latter. The assemblage, in that it includes tool forms such as trianguloid end scrapers, small finely made piercers or gravers, beaks, transverse scrapers and combination tools including borers, is also very Paleoindian-like. This does not mean it is identical to the material seen on earlier sites and particularly fluted point sites. The small general size of the end scrapers, the frequent presence of more oval end scrapers, and even the suggestions of small blade production are clearly distinct from that seen on the fluted point sites. However, such characteristics are also found in Holcombe assemblages suggesting a close connection to Hi-Lo (Ellis 2004).

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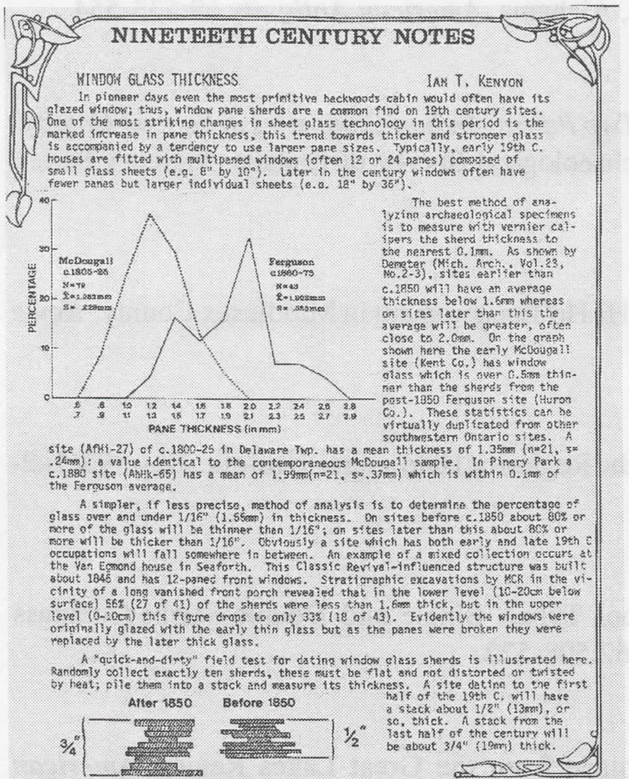
My name is Meredith Fraser, and I am currently engaged in doctoral research that explores how notions, perceptions, and experiences of both ability and disability affect archaeological practice. I am conducting this project with a view toward identifying social, physical, financial, academic barriers that exist within the discipline in order to work toward reducing -- or even eliminating -- some of them. This will contribute in a significant way to the ultimate goal of this project, which is to *make archaeology more accessible!* In order to move forward with this work, I need to meet with fellow archaeologists who will work in collaboration with me by teaching me about the ways in which illness, injury, disability, and/or aging have impacted, or have not impacted, how they "do" archaeology. Your input would make a key contribution to this project! If you are interested in finding out more about the project, or in volunteering, please do not hesitate to contact me by e-mail at: theburiedpast@yahoo.com, or by phone at: (519) 434-5414

Nineteenth Century Notes



NINETEETH CENTURY NOTES 8

WINDOW GLASS THICKNESS

IAN T. KENYON

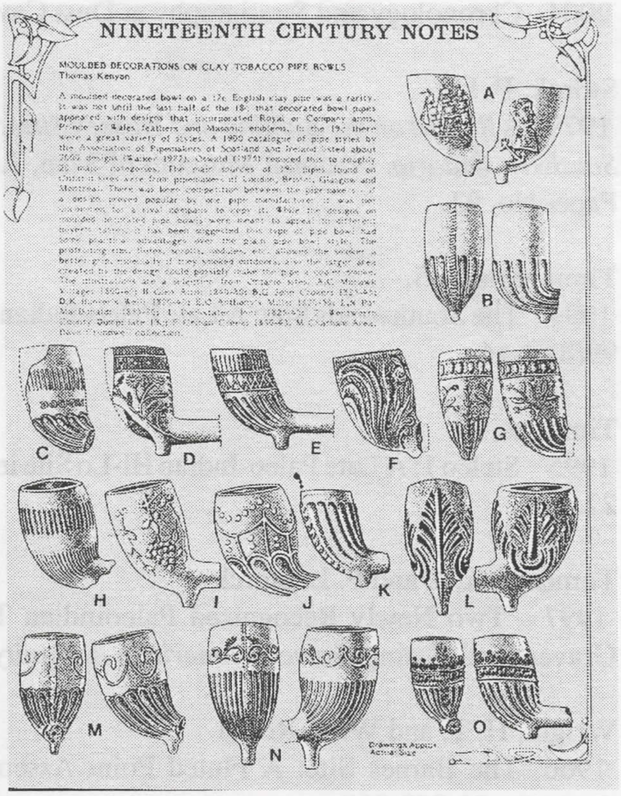
In pioneer days even the most primitive backwoods cabin would often have its glazed window; thus, window pane sherds are a common find on 19th century sites. One of the most striking changes in sheet glass technology in this period is the marked increase in pane thickness, this trend towards thicker and stronger glass is accompanied by a tendency to use larger pane sizes. Typically, early 19th C. houses are fitted with multipaned windows (often 12 or 24 panes) composed of small glass sheets (e.g. 8" by 10"). Later in the century windows often have fewer panes but larger individual sheets (e.g. 18" by 36").

The best method of analyzing archaeological specimens is to measure with vernier calipers the sherd thickness to the nearest 0.1mm. As shown by Demeter (Mich. Arch., Vol.23, No.2-3), sites earlier than c.1850 will have an average thickness below 1.6mm whereas on sites later than this the average will be greater, often close to 2.0mm. On the graph shown here the early McDougall site (Kent Co.) has window glass which is over 0.5mm thinner than the sherds from the post-1850 Ferguson site (Huron Co.). These statistics can be virtually duplicated from other southwestern Ontario sites. A site (AfHi-27) of c.1800-25 in Delaware Twp. has a mean thickness of 1.35mm (n=21, s=.24mm): a value identical to the contemporaneous McDougall sample. In Pinery Park a c.1880 site (AhHk-65) has a mean of 1.99mm(n=21, s=.37mm) which is within 0.1mm of the Ferguson average.

A simpler, if less precise, method of analysis is to determine the percentage of glass over and under 1/16" (1.55mm) in thickness. On sites before c.1850 about 80% or more of the glass will be thinner than 1/16"; on sites later than this about 80% or more will be thicker than 1/16". Obviously a site which has both early and late 19th C occupations will fall somewhere in between. An example of a mixed collection occurs at the Van Egmond house in Seaforth. This Classic Revival-influenced structure was built about 1846 and has 12-paned front windows. Stratigraphic excavations by MCR in the vicinity of a long vanished front porch revealed that in the lower level (10-20cm below surface) 66% (27 of 41) of the sherds were less than 1.6mm thick, but in the upper level (0-10cm) this figure drops to only 33% (18 of 43). Evidently the windows were originally glazed with the early thin glass but as the panes were broken they were replaced by the later thick glass.

A "quick-and-dirty" field test for dating window glass sherds is illustrated here. Randomly collect exactly ten sherds, these must be flat and not distorted or twisted by heat; pile them into a stack and measure its thickness. A site dating to the first half of the 19th C. will have a stack about 1/2" (13mm), or so, thick. A stack from the last half of the century will be about 3/4" (19mm) thick.

PERCENTAGE
40
30
20
10
0
McDougall
c.1805-25
N=78
X̄=1.352mm
S=.220mm
Ferguson
c.1860-75
N=43
X̄=1.903mm
S=.353mm
.6 .7
.8 .9
1.0 1.1
1.2 1.3
1.4 1.5
1.6 1.7
1.8 1.9
2.0 2.1
2.2 2.3
2.4 2.5
2.6 2.7
2.8 2.9
PANE THICKNESS (in mm)
After 1850
Before 1850
3/4"
1/2"



NINETEENTH CENTURY NOTES

MOULDED DECORATIONS ON CLAY TOBACCO PIPE BOWLS

Thomas Kenyon

A
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Drawings Approx Actual Size

One of the most popular past *Kewa* features was 19th Century Notes, a series of illustrated one page articles on various aspects of historic archaeology put together by the late Thomas and Ian T. Kenyon. This complete series is available from the London Chapter in a cirlox binding for the bargain price of $6.00 plus $1.50 for postage and handling. Order yours today from cjellis@uwo.ca.